ASSESSMENT

Teachers are encouraged to assess students on an ongoing basis, using Assessment *as* Learning, Assessment *for* Learning, and Assessment *of* Learning. Through the use of a chapter Foldable, a self-assessment master, unit project checklists, and reflection, students are encouraged to assess their own progress, to identify their own strengths and weaknesses, and then to consider what they need to do in order to progress. Teachers are encouraged to coach students through this process.

Many opportunities for Assessment *as* Learning and Assessment *for* Learning assist teachers in identifying ways they can facilitate student progress to a higher level of conceptual and procedural understanding and skill development. Assessment *of* Learning further contributes to growth as teachers and students begin to use this summative assessment as a time for communication and reflections about future goals and strategies for improving.

Assessment *as* Learning (Diagnostic)

These assessment tools include student reflection. They are provided throughout the *Mathematics 10* student resource and Teacher's Resource to assist the teacher in programming by identifying student weaknesses and gaps.

- The **Foldables** activity in each chapter gives students a way to organize their learning and provides them with opportunities to express their understanding in their own words. A unique part of each Foldable asks students to keep track of what they need to work on, allowing them to be self-directed learners.
- **Reflect and Respond** questions at the end of each **Investigate** provide early opportunities for students to construct knowledge about the section content.
- The **Create Connections** questions allow students to explore their initial understandings of a concept.
- The **Warm-Up** exercises, and **chapter self-assessment** and **prerequisite skills** BLMs in the Teacher's Resource provide additional support in identifying and facilitating student learning.
- The suggested assignments, questions, and activities in the **Meeting Student Needs** boxes in the Teacher's Resource address a variety of learner needs, including those of English language learners and gifted and enrichment students.
- Diagnostic support in the form of introductory questions designed to open discussion in the classroom and in the form of exploration activities are provided in the Teacher's Resource, where appropriate.

Assessment *for* Learning (Formative)

Formative assessment tools are provided throughout the *Mathematics 10* student resource and the Teacher's Resource.

- The **unit opener** information and related discussion, **chapter opener** and related discussion, and the **prerequisite skills** BLM in the Teacher's Resource activate learning necessary for students' success in the upcoming unit and chapter.
- The **chapter self- assessment** BLM and the Assessment *for* Learning box on the back of the chapter foldout are designed to provide teachers with an opportunity to activate student knowledge and assess the understanding that students should have to begin the chapter.

- The **Reflect and Respond** questions provide an opportunity to determine students' understanding of concepts through conversations and/or written work.
- The **Your Turn** questions target key skills of a section.
- Students can use the **Practise** assignments in each section to check their understanding.
- The **chapter reviews** and **unit reviews** provide opportunities to assess knowledge/understanding, applications, communications, mental math, and problem solving.

Assessment *of* Learning (Summative)

Summative assessment is provided in the following ways:

- **Practice tests** and **unit tests** are provided at the end of the chapters in the student resource, and **chapter tests** are provided as blackline masters in the Teacher's Resource.
- The **unit project** section of the **Unit Connections** at the end of each unit provides teachers with an opportunity to check whether students have synthesized the concepts and procedures. A **unit project checklist** BLM helps students assess whether or not they have completed the unit project, and a **unit project final report** BLM helps students identify where they have shown their understanding of each concept, skill, and procedure. A rubric for each unit project is included in the Teacher's Resource.

Teachers are encouraged to use alternative assessments beyond formal testing. For example, student work on the unit project displays how well a student understands mathematical concepts and processes.

Portfolio Assessment

Student-selected portfolios provide a powerful platform for assessing students' mathematical thinking. Portfolios provide the following benefits:

- help teachers assess students' growth and mathematical understanding
- give insight into students' self-awareness about their own progress
- help parents/guardians understand their child's growth

Mathematics 10 has many components that provide ideal portfolio items. Including any or all of the following chapter items is a non-threatening, formative way to gain insight into students' progress

- student responses to the chapter and unit openers
- answers to the **Reflect and Respond** questions, which give students early opportunities to construct knowledge about the section content
- answers to the **Create Connections** questions, which allow students to explore their initial understanding of concepts
- journal responses, which show student understanding of the chapter skills and processes
- student responses to the **unit project** questions

Master 1 Project Rubric

Master 1 Project Rubric is a generic rubric developed for assessing student work. It highlights the level of development of conceptual and procedural understanding within a particular topic, and provides consistent assessment strategies for multiple approaches and/or for multiple solutions to problems and problem solving. This unique rubric includes

- a Score/Level grade ranging from 1 to 5 (Beginning to Standard of Excellence) **Note:** The Teacher Centre on the Online Learning Centre provides a four-level rubric.
- a Holistic Descriptor for each grade range, describing the level of understanding and communication skills
- Specific Notes, which provide descriptions of each grade range. These notes are meant to represent what the majority of students display. They are by no means exhaustive of all possible solutions. Teachers are encouraged to continually refer to both the specific and holistic pieces of the rubric.

Teachers are encouraged to share the rubric with students early in each project. This will help students become active participants in their own assessment and program planning. Discussing and building the Specific Notes with students allows them to engage actively in their learning.

CONCRETE MATERIALS

The McGraw-Hill Ryerson *Mathematics 10* program engages students in a variety of worthwhile mathematical tasks that span the continuum from concrete to abstract.

Where appropriate, concept development in the program begins with students working with concrete materials. Most **Investigates** have students using commonplace materials and conventional mathematical manipulatives in a hands-on approach. After an appropriate number of hands-on opportunities, students move from the pictorial to the symbolic in the **examples**, **Your Turn**, and **Check Your Understanding** exercises.

TECHNOLOGY

Where appropriate, lessons are designed to provide students with the opportunity to develop their skills in the use of various technologies, but not to rely on this technology to think mathematically. Students are also asked to use the Internet to research information related to problems they are required to solve.

The student resource provides technology learning that matches technology requirements for curriculum expectations and that deepens students' conceptual understanding.

Blackline Masters of technology activities are included in the Teacher's Resource when grade-specific outcomes suggest these are needed. The masters include directions for using different softwares and graphing calculators common in many classrooms. These worksheets can easily be used in a computer laboratory.